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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,267	11/17/2003	Nathan R. Brown	2269-4375.1US (99-1029.01)	4590
24247	7590	04/07/2005	EXAMINER	
TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110			MACARTHUR, SYLVIA	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

10/715,267

Applicant(s)

BROWN, NATHAN R.

Examiner

Sylvia R MacArthur

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/17/03, 6/24/03
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 and 9-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al (US 6,857,947).

Re Claim 1: Wang et al teaches an advanced CMP system with smart endpoint detection. The method used to perform the endpoint detection comprises selectively applying a plurality of different amounts of pressure to different, selected locations of a backside of the semiconductor device structure and a polishing or planarizing at least one layer of the surface of the semiconductor device structure, see the abstract.

Re Claim 9: The polishing discussed in Wang et al is CMP according to the title.

Re Claim 10: The selectively applying a plurality of different amounts of pressure and the polishing or planarizing together effect the formation of a substantially planar surface on the semiconductor device structure, see the abstract.

Re Claim 11: At least one raised area of the active surface of the semiconductor device structure has been located according to col. 8 lines 50-60.

Re Claim 12: The selectively applying a plurality of different amounts of pressure comprises applying an appropriate amount of pressure to the backside of the semiconductor device structure, opposite the at least one raised area so as to planarize the active surface during the polishing or planarizing, according to col. 8 lines 19-50.

Re Claim 13: Selectively applying a plurality of different amounts of pressure comprises selectively applying pressure to a backside of another semiconductor device structure of the same type as the semiconductor device structure opposite a location of the at least one raised area of the semiconductor device structure, see col.14 lines 5-48.

Re Claim 14: The polishing of Wang et al comprises forming a substantially planar surface on the semiconductor device structure, see abstract.

Re Claim 15: The method of Wang et al comprising substantially simultaneously applying the plurality of different amounts of pressure to the backside of the semiconductor device structure, see col. 14 liens 5-47.

Re Claim 16: The method of Wang et al further comprises polishing at least one layer of a first semiconductor device structure; Locating any raised areas on the first semiconductor device structure following the polishing selectively applying pressure to a backside of at least one second semiconductor device structure of a same type as the first semiconductor device structure, the selectively applying being effected at locations beneath areas of the at least one second semiconductor device structure that correspond to the raised areas of the first semiconductor device structure; and at least mechanically polishing at least one layer of the at least one second semiconductor device structure, see col. 13 liens 1-32.

Re Claim 17: The method of Wang et al further comprises locating by

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employing metrology techniques, see col. 13 lines 4-6.

Re Claim 18: The method of Wang et al wherein selectively applying comprises applying a sufficient amount of pressure at each of the locations to form a substantially planar surface on the at least one second semiconductor device structure, see the paragraph joining col. 4 and 5.

Re Claim 19: The method of Wang et al wherein selectively applying comprises selectively applying different amounts of pressure at different ones of the locations, see the abstract.

Re Claim 20: The method of Wang et al wherein selectively applying comprises determining an appropriate amount of pressure to apply to each of the locations based on a height of each corresponding raised area, see col. 11 lines 45-64..

Re Claim 21: The method of Wang et al wherein selectively applying comprises selectively applying pressure to the backside of the at least one second semiconductor device structure to at least one annular location see the paragraph joining col. 4 and 5.

Re Claim 22: The method of Wang et al, wherein the polishing comprises mechanically polishing the at least one layer of the first semiconductor device structure, see the title.

Re Claim 23: The method of Wang et al, wherein polishing comprises chemical-mechanical polishing the at least one layer of the first semiconductor device structure, see the title

Re Claim 24: The method of Wang et al, wherein the at least mechanically

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polishing comprises chemical-mechanical polishing the at least one layer of the at least one second semiconductor device structure see the paragraph joining col. 4 and 5.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2,6-8, 25, and 29- 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al in view of Chen (US 6,0505,882).

The teachings of Wang et al were discussed above.

Wang et al fails to teach independently moveable pressurization structures.

Re Claims 2, 6, 25, and 29: Chen teaches independently movable rods 108. Chen teaches that during polishing friction forces (causing biasing) from the polishing pad with force against the rods and the rods apply pressure to the substrate see col.4 lines 60-67.

The motivation to provide the independent movable rods of Chen in the apparatus of Wang is that the rods apply pressure and surround the substrate to provide a retainer during polishing. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the apparatus of Wang et al to provide the independently movable structures of Chen.

Regarding claims 8 and 31: The frictional force discussed in Chen acts as positive pressure.

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Re Claims 9 and 30: Chen cites in the paragraph joining cols. 5 and 6 that a vacuum source is used to lift the carrier away from the substrate.

5. Claims 3-5, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al in view of Chen as applied to claims 2,6-8,25,and 29-31 above, and further in view of Talieh et al (US 5,575,707).

The teachings of Wang et al and Chen were discussed above.

Both fail to teach magnetically biasing.

Talieh teaches a polishing pad cluster for polishing a semiconductor wafer.

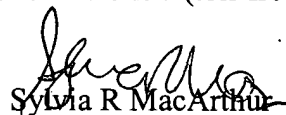
Talieh teaches a magnetic disk 222 including one or more magnets that generate a magnetic field. In col. 4 lines 42-60, Talieh et al cites that the magnetic disk creates a non-uniform magnetic field along the wafer. The motivation to provide this feature is that it is known to enhance planarization of the wafer, see col. 1 lines 58-67. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide magnetically biasing in the method of Wang et al modified by Chen. The use of magnetic force is known to provide a force gradient along the wafer that enhances polishing.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R MacArthur whose telephone number is 571-272-1438. The examiner can normally be reached on M-F during the core hours of 9 a.m. and 3 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Sylvia R MacArthur
Patent Examiner
Art Unit 1763

March 31, 2005